

## PATENT ABSTRACTS OF JAPAN

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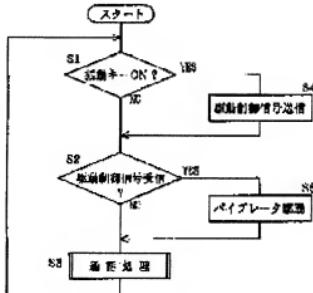
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## (54) RADIO TELEPHONY EQUIPMENT

## (57)Abstract:

**PROBLEM TO BE SOLVED:** To provide a new communication means for telephone call by utilizing vibration generating means of radio telephony equipment provided for notifying incoming calls.

**SOLUTION:** A control circuit is constituted to transmit the drive control signal of a vibrator to the outside via a transmitting-receiving section (steps S1 and S4), and when the transmitting-receiving section receives the drive control signal transmitted from the outside, it controls the drive of the vibrator according to the received drive control signal (steps S2 and S5). Therefore, a calling person can cause vibrate the enclosure of a PHS(personal handy-phone system) used on the other side at arbitrary timings to vibrate, while the calling person talks over radio telephony equipment by transmitting the drive control signal to the other side from the PHS used by the calling person himself.



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## CLAIMS

## [Claim(s)]

[Claim 1]A radio telephone equipment provided with a vibration generating means constituted so that a vibration characterized by comprising the following which self generated might be transmitted to a case. A reception means which receives a driving control signal of said vibration generating means transmitted from the exterior.

A transmitting means constituted by ability ready for sending in said driving control signal.

A control means which carries out drive controlling of said vibration generating means according to said driving control signal which said reception means received.

[Claim 2]The radio telephone equipment according to claim 1, wherein said transmitting means transmits said driving control signal using a part of transmission area of voice data.

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**DETAILED DESCRIPTION**

[Detailed Description of the Invention]

[0001]

[Field of the Invention]This invention relates to a radio telephone equipment provided with the vibration generating means constituted so that vibration which self generated might be transmitted to a case.

[0002]

[Problem(s) to be Solved by the Invention]\*\* -- it needs -- a radio telephone equipment -- a cell phone unit and a personal handy phone device (PHS:Personal Handyphone System), It is also possible to aim at communication between call persons by transmitting a sound mutually fundamentally, and to transmit and receive the so-called text of "e-mail" etc. depending on the kind of device.

[0003]By the way, the thing for which it replaces with making them generate a ringer tone when a message is received in a cell phone unit or PHS, the vibrator (vibration generating means) arranged inside the case is vibrated, and the vibration is told to a case. There are some which reported mail arrival to the user who carries a cell phone unit by vibration of a case.

[0004]An artificer used to make this invention paying attention to the function of the vibrator, and the

purpose is to use the vibration generating means provided in mail arrival information, and there is in providing the new communication means at the time of a telephone call.

[0005]

[Means for Solving the Problem]According to the radio telephone equipment according to claim 1, ability ready for sending constitutes a driving control signal over a vibration generating means of the other party by a transmitting means, and a control means will carry out drive controlling of the vibration generating means according to the received driving control signal, if a reception means receives a driving control signal transmitted from the exterior. That is, the call person can transmit a driving control signal to the call partner side from a device which self is using, and can vibrate a case of a device which the other party is using to arbitrary timing under telephone call.

[0006]Therefore, when a sign that a partner becomes sleepy, consciousness becomes diffuse and a degree of concentration to a telephone call is falling during a telephone call for example, is sensed, consciousness of the other party can be made to evoke by transmitting a driving control signal to the other party, and vibrating a case. If it is one of those which are constituted possible to perform a pitched-against each other type game, for example in a talk state, to predetermined timing according to an advancing state of the game, by transmitting a driving control signal, a case can also be vibrated and it can use also as a presentation means of a game. As mentioned above, it becomes possible to provide a means of new KOMYUNISHON which is not in the former by using the existing vibration generating means generally established as an object for mail arrival information.

[0007]According to the radio telephone equipment according to claim 2, a transmitting means transmits a driving control signal using a part of transmission area of voice data. For example, when transmitting a driving control signal, in a slot which transmits first, the transmitting side transmits a special data pattern in which it is shown that a driving control signal is included to a prescribed position of voice data transmitted by the following transmission slot at the time of a telephone call. And if a reception means of a receiver receives the special data pattern, a driving control signal transmitted by the following transmission slot will be recognized, and a control means will carry out drive controlling of the vibration generating means.

[0008]That is, in each terminal unit, since it transmits by setting up a protocol for transmitting a driving control signal using a transmission area of voice data, a driving control signal is transmitted as voice data on the existing protocol. Therefore, in order to transmit said signal, it is not necessary to correspond in particular by the system side, and said signal can be transmitted easily.

[0009]

[Embodiment of the Invention]Hereafter, one example of this invention is described with reference to drawings. Drawing 4 is a perspective view showing the appearance of PHS. In drawing 4, to the front part of the case 2 which constitutes PHS(radio telephone equipment) 1. The display 6 etc. which display the key operation section 3, the microphone 4, the loudspeaker 5, a telephone number, etc. which consist of various keys, such as a call start key, a telephone call termination key, a redial key, a numerical keypad of "0" - "9", the \* (asterisk) key, and the # (sharp) key, are formed. And the elastic-type rod antenna (an antenna is only called hereafter) 7 is arranged at the upper face part of the case 2.

[0010]Drawing 3 is a functional block diagram showing the electric constitution of PHS1. In drawing 3, PHS1 is constituted considering the control circuit (control means) 8 which consists of microcomputers etc. as a

center, and the manipulate signal from the key operation section 3 is given to the control circuit 8. The control circuit 8 controls the display in the display 6.

[0011]In [ if the A/D conversion of the audio signal inputted into the microphone 4 is given and carried out to the voice processing part 9 ] the data conversion part 10, For example, it is changed into pi / 4 shift DQPSK (Differential Quadrature Phase Shift Keying) signal. And if the send data changed into the DQPSK signal (digital modulation) is given to the transmission and reception section 11, by the carrier signal of 1.9 GHz bands, quadrature modulation of it will be carried out and it will be transmitted outside as a radio wave signal from the antenna 7.

[0012]When the antenna 7 receives a radio wave signal, it gets over in the transmission and reception section 11 and the data conversion part 10, and an input signal is given to the voice processing part 9. And if D/A conversion is carried out in the voice processing part 9, it will be outputted as an audio signal from the loudspeaker 5.

[0013]The control circuit 8 makes a ringer tone output from the loudspeaker 5 with performing control of the voice processing part 9, the data conversion part 10, and the transmission and reception section 11, and outputting the data of a ringer tone to the voice processing part 9. On the other hand, to the control circuit 8, information, including detection of a terminating signal, a sending signal or the detection value of a received signal level, etc., is given from the transmission and reception section 11. The storage parts store 12 which consists of RAM, an EEPROM, etc. is connected to the control circuit 8, and the control circuit 8 performs the writing and read-out of data to the storage parts store 12 if needed.

[0014]The case 2 is vibrated by making the vibrator (vibration generating means) 14 drive via the actuator 13, when the control circuit 8 has mail arrival. Although the vibrator 14 is not specifically illustrated, it rotates the weight attached where eccentricity is carried out to the axis of rotation of a motor, and generates vibration.

[0015]The oscillating key 3a is arranged at the key operation section 3. And the control circuit 8 will transmit the control signal (driving control signal) for vibrating the vibrator 14 of PHS1 by the side of a call partner via the data conversion part 10, the transmission and reception section 11, and the antenna 7, if ON operation of the oscillating key 3a is carried out during a telephone call. The antenna 7, the data conversion part 10, and the transmission and reception section 11 constitute the transmitting means 15a and the reception means 15b.

[0016]Here, drawing 2 shows the slot composition of the information channel TCH (Traffic CHannel) for transmitting User Information. The voice data under telephone call is transmitted using the 160-bit field currently assigned to the information channel TCH. For example, the control circuit 8 gives a control signal to the data conversion part 10, and transmits a data pattern "1010101010" to 10 bits of the last of voice data as a driving control signal DCS.

[0017]And only fixed time (for example, 3 seconds) makes the vibrator 14 drive via the actuator 13, and the control circuit 8 vibrates the case 2, when self receives the driving control signal transmitted from the exterior.

[0018]Next, an operation of this example is explained also with reference to drawing 1. Drawing 1 is a flow chart which shows the control content under telephone call of the control circuit 8. The control circuit 8 judges [ be / it / under / telephone call / setting ] whether it judged whether in Step S1, ON operation of the

oscillating key 3a by the side of itself was carried out, and the driving control signal was transmitted from the other party in Step S2. And when it is judged as "NO" also in which step, after performing the usual call processing (Step S3), it shifts to Step S1.

[0019]Here, also suppose the other party of a telephone call that the PHS1 [ same ] is used. And when duration of call becomes long for example, it may be sensed that the degree of concentration to the telephone call of the other party is falling judging from the situation of the voice of the other party under telephone call, etc. If ON operation of the oscillating key 3a is carried out when such, the control circuit 8 will be judged to be "YES" at Step S1, and will transmit a driving control signal to PHS1 of the other party (step S4).

[0020]In this case, the control circuit 8 makes voice data of the slot which transmits to the beginning of one frame an oar "F (HEX)", for example. The data of an oar "F" is a special data pattern corresponding to a soundless state, and the control circuit 8 of PHS1 which received the all "F" data recognizes that driving control signal DCS in the slot transmitted to the next may be contained. And the control circuit 8 of the transmitting side will shift to Step S2, if the data pattern in which driving control signal DCS mentioned above is shown is transmitted to 10 bits of the last of the voice data in the following transmission slot.

[0021]If the data pattern of driving control signal DCS is extracted from the voice data in the transmission slot concerned, in Step S2, the control circuit 8 of PHS1 of a receiver will be judged to be "YES", will give a control signal to the actuator 13, and will carry out the fixed time drive of the vibrator 14 (Step S5). Then, since the case 2 vibrates, a call partner is surprised at vibration of the case 2 by which it is suddenly generated during a telephone call, and consciousness is evoked. After that, it shifts to Step S3.

[0022]According to this example, as mentioned above the control circuit 8, If the driving control signal with which the driving control signal of the vibrator 14 is constituted outside via the transmission and reception section 11 at ability ready for sending, and the transmission and reception section 11 is transmitted from the exterior is received, Since drive controlling of the vibrator 14 is carried out according to the received driving control signal, the call person can vibrate the case 2 of PHS1 which the other party is using to the arbitrary timing under telephone call by transmitting a driving control signal to the call partner side from PHS1 which self is using.

[0023]Therefore, when the sign that a partner becomes sleepy, consciousness becomes diffuse and the degree of concentration to a telephone call is falling during a telephone call for example, is sensed, a call partner can be surprised and consciousness can be made to evoke by vibrating the case 2 of PHS1 of the other party. That is, it becomes possible to provide the new KOMYUNISHON means which is not in the former by using the existing vibrator 14 generally formed as an object for mail arrival information.

[0024]Since a driving control signal is transmitted using a part of transmission area of voice data according to this example, a driving control signal is transmitted as voice data on the existing protocol. Therefore, in order to transmit said signal, it is not necessary to correspond in particular by the system side, and said signal can be transmitted easily.

[0025]This invention is not limited only to the example which was described above and indicated on the drawing, and following modification or extension are possible for it. If ON operation of the oscillating key 3a is carried out, whenever it will carry out ON operation not only of what carries out the fixed time drive of the vibrator 14 but the oscillating key 3a, it may be made to perform the drive start and driving stoppage of the

vibrator 14 by turns. Even when a radio telephone equipment is a cell phone unit, a driving control signal can be similarly transmitted using a part of transmission area of voice data. It may be made to transmit the data of the driving control signal defined in the channel USPCH using the channel USPCH (UserPacketCHannel) which can be used as an option during the telephone call. In order to use the channel USPCH in this case, it is necessary to correspond to the system side.

[0026]When the tone signal of the numerical keypad is transmitted during a telephone call because the transmitting side carries out ONN operation of the specific numerical keypad of the key operation section 3, and a receiver receives the tone signal of the specific numerical keypad, it may be made to make the vibrator 14 drive. Or when it is constituted for example, so that the system of a radio telephone equipment can use two channels simultaneously. The channel for transmitting voice data establishes the channel for transmitting the special control signal which can be separately used as an option, and it may be made to transmit a driving control signal using the channel. For example, if it is in the radio telephone equipment constituted possible to perform a pitched-against each other type game in a talk state, to the predetermined timing according to the advancing state of the game, by transmitting a driving control signal, the case of the other party can also be vibrated and it can use also as a presentation means of a game.

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## DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]

[Drawing 1]The flow chart which is one example of this invention and shows the control content under telephone call of a control circuit

[Drawing 2]The frame structure figure of the information channel TCH

[Drawing 3]The functional block diagram showing the electric constitution of PHS

[Drawing 4]The perspective view showing the appearance of PHS

[Description of Notations]

1 -- a control circuit (control means) and 14 show vibrator (vibration generating means), 15a shows a transmitting means, and, as for PHS (radio telephone equipment) and 2, 15b shows a reception means, as for a case and 8.

[Translation done.]

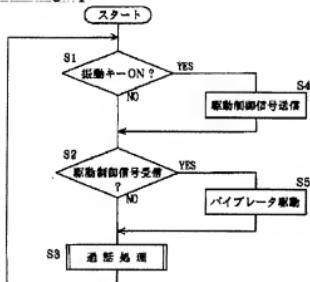
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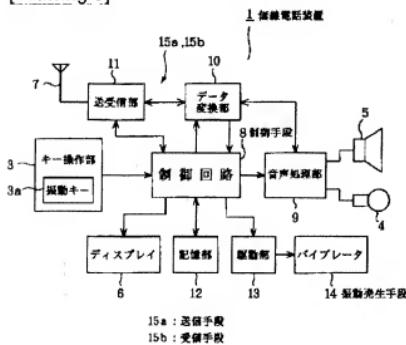
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DRAWINGS

[Drawing 1]



[Drawing 3]



15a : 送信手段  
15b : 受信手段

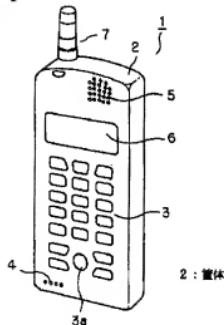
## [Drawing 2]

TG1	R	SS	PR	UW	CI	SA	音声データなど	DCS	CRC	G
FACCH	4	2	6	16	4	16	150	10	16	4
	SACCH						150			

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R : 通話応答ランプタイム  
 SS : スタートシンバル  
 PR : プリランプ  
 UW : 同期ワード  
 CI : チャネル識別  
 CRC : 戻り検査用ビット  
 G : ガードビット  
 DCS : 駆動制御信号

## [Drawing 4]



[Translation done.]